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NEWSLETTER OF THE LONDON CHAPTER,
ONTARIO ARCHAEOLOGICAL SOCIETY
c/o Museum of Ontario Archaeology
1600 Attawandaron Road, London, ON N6G 3M6

November & December 2016 16-07 & 16-08

The **January 10, 2019** meeting of the London Chapter with feature speaker **Chris Ellis,** now retired from UWO, on: *Culloden Acres (AfHj-90): A Small Paleo Site near Komoka, Ontario.* This talk will report on the work and in progress results of the investigations at this ancient, ca. 12,500 years old, fluted point site undertaken in the early 1990s with Dr. Brian Deller. The site was discovered by chapter member Darcy Fallon! Note also that February 14th meeting is Member's Night and we need some people to volunteer to give short talks -- so please contact Chris Ellis if interested (cjellis@uwo.ca).

Speaker's Night is held the 2nd Thursday of each month (January to April and September to December) at the Museum of Ontario Archaeology, 1600 Attawandaron Road, near the corner of Wonderland & Fanshawe Park Road, in the northwest part of the city. The meeting starts at 7:30 pm. Doors open at 7:00 PM and as usual there will be free juice and cookies!

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A Popeyed Birdstone Preform from Sarnia, Ontario

by Michael Rocca and Chris Ellis

We document here a distinctive, banded slate, birdstone preform recovered by the senior author (Figures 1 and 2; Table 1). The preform was found while Rocca was working in his front yard garden situated at the edge of the former shoreline of Lake Wawanosh, a few hundred metres inland from Lake Huron and a couple km north of Chris Hadfield Airport. It is probable that the item was not in its specific original location as the area had been leveled to build the nearby house. Intrigued by the find Rocca reported it to Ellis who encouraged him to have it photographed and described.

Birdstones are rare finds, and despite decades of describing and interpreting them (e.g., Moorehead 1917; Townsend 1959) we are no closer to understanding them, part of the problem being they are largely from private collections that have lost their provenance. Very few have been recovered by archaeologists in the Great Lakes region in an *in situ* context that would allow us to easily interpret their use and meaning. The rarity of such items, the exquisite workmanship, as well as the dominance of finds with only select individuals in burial contexts (e.g., Abel et al. 2009; Cunningham 1943; Donaldson and Wortner 1995; Ritchie 1944), suggests a more sacred function or at the very least a predominant social/ceremonial/ritual role. This would not necessarily mean they had no profane uses, as the distinctions between the sacred and profane were probably not part of the makers' world view. Nonetheless, while there have been attempts to see birdstones as serving primarily a relatively benign utilitarian function, most commonly as spearthrower weights, none of those explanations work very well.

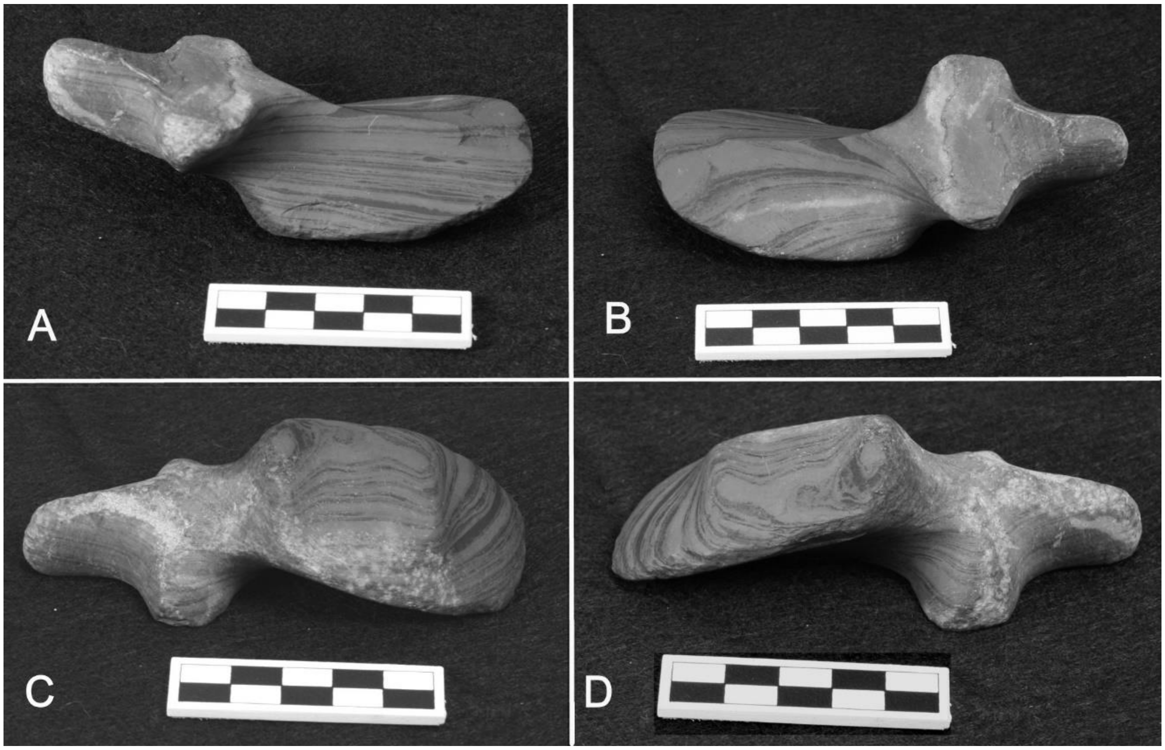

Figure 1: Lateral Views of Rocca Birdstone preform.

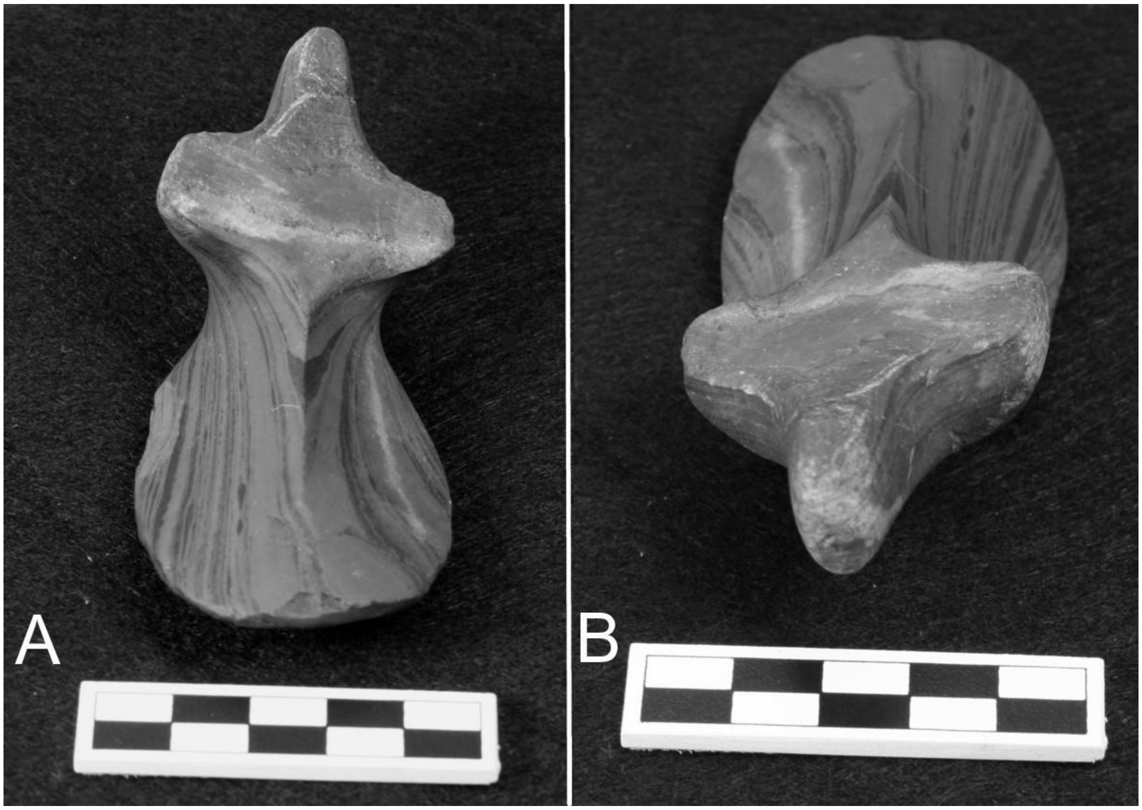

Figure 2: End Views of Rocca Birdstone Preform.

Detailed recording of every find like this item can be extremely useful. For instance, as the recent report of another example in *Kewa* by Dann (2015) indicates, the variability documented may assist in refining our chronology of changes over time in these items. Plottings of their combined spatial distributions, especially of preforms, can perhaps assist is identifying production centres and even perhaps seasons of manufacture (e.g., Ellis and Deller 2014). Also, unfinished examples give us a better idea of how the items were actually made. We can never have large enough samples.

The current birdstone is obviously unfinished, lacking complete grinding and polishing and still retaining areas where the initial shaping by pecking is visible, notably in the head area and along one side margin of the body (Figure 1c-d). It also lacks the diagonal drilled basal "mounting" holes found on completed items. The top of the head is also flattened and it seems that this surface represents an original unmodified surface of the slate nodule on which the item was made. The head has minimal finishing versus the body of the item, which suggests the procedure of grinding the item into a finished shape and surface may have tended to follow a rule of completing the body first before finishing the head. The unfinished nature suggests an occupation or workshop site and the finding of an unfinished biface on Kettle Point chert and some flaking debris in the same vicinity is consistent with such an interpretation.

The preform was obviously intended for the distinctive pop-eyed form with wide expanded oval body and two transverse ridges across the front and back of the base. If finished the drill holes would have gone through the centre of those transverse bottom ridges. These features as a whole serve to distinguish this form from other examples, such as the eyeless, narrow bodied ("bar type") forms with an upright flaring tail that lack the transverse ridges and have the two diagonal holes drilled to the base originating in the breast and butt respectively. The eyeless forms actually do resemble birds, are known to date early and specifically to the Late Archaic Smallpoint era of ca. 3300-2800 years ago. The examples with massive pop-eyes (or ears), such as the current example, are difficult to see as birds and even seem to be fantastical representations. Contextual data indicates an association with the Early Woodland Meadowood Phase of ca. 2800-2500 years ago and a comparable age is implied for the Sarnia example.

Table 1. Rocca Birdstone Preform Variables.

Characteristic	Measurement
Overall Length	104.5 mm
Head Length	55.2 mm
Head Width	43.7 mm
Snout Length	24.9 mm
Body Width	43.7 mm
Body Length	64.5 mm

It is difficult to determine exactly why the Rocca birdstone was discarded, but as can be seen in end and side views the head is canted at an angle versus the base. Given that angle and that the top surface of the head is a remnant of the original nodule, inaccurate placement of the head relative to the base in that nodule may have led to this characteristic and prevented the production of an item with the desired proportions and overall size.

Acknowledgments: Ellis thanks Sustainable Archaeology at the Museum of Ontario Archaeology for use of their photographic facilities.

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A Discriminant Function Analysis of Meadowood Points from Ontario

by Adam Hossack

Purpose

In 2010 Kristen Snarey and Christopher Ellis co-authored a paper, based partially on an earlier study by Snary (2000) in which the classification of various Late Archaic and Early Woodland projectile point forms as either arrow tips or dart tips was explored. Utilizing a variety of discriminant functions, various metric attributes of Genessee, Adder Orchard, Crawford Knoll, Innes, and Meadowood points were evaluated. Their study employed the analytical methods developed by Michael Shott (1997).

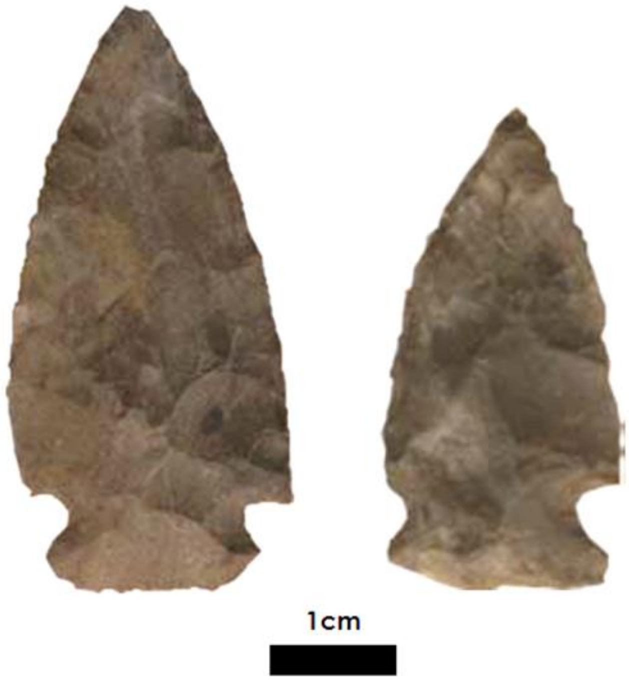

Figure 1: Meadowood Projectile Points from Archaeological Site AfGw-150 (Stantec 2014).

A major outcome of this research project was that, after evaluating various formulae, it could be consistently demonstrated that while Late Archaic Crawford Knoll points were most often identified as arrow tips, Early Woodland Meadowood points were almost exclusively identified as dart tips. Although Snarey and Ellis posited that the bow and arrow may have been intermittently adopted in the Late Archaic and its use severely curtailed in the Early Woodland (to the point that virtually no Meadowood points can be identified as arrow tips) before its eventual rise to dominance in the Middle Woodland period, it was felt that such a marked shift back to dart thrower technology was “strange” and that these results undermined confidence in the identification of Crawford Knoll points as arrow tips irrespective of the results of metric analysis (Snarey and Ellis 2010:30). The fact that the most reliable methods of metric attribute analysis examined in the study, Shott’s One- and Three-Variable discriminant functions, consistently identified the large majority of Meadowood points analyzed as dart tips also contradicts J.V. Wright’s assertion that Meadowood points are in fact arrow tips based on their stem widths (Wright 1994:60-62). It is possible that the somewhat small sample size of Meadowood points in Snarey and Ellis’s study (n=61) as well as the fact that they were drawn from only two sites, Bruce Boyd and Welke-Tonokonoh, may have affected this analysis.

Further to evaluating the identity of Meadowood points (Figure 1) as either arrow tips, dart tips, or an intermediary form that could function as either, metric data on this projectile point type has been gathered from a wide variety of sites excavated by Archaeologix, Inc. (Archaeologix), Golder Associates, Ltd. (Golder), Timmins Martelle Heritage Consultants (TMHC), and Stantec Consulting, Ltd (Stantec). between 2000 and 2017. It is posited that a larger sample size coupled with the elimination of individual

site idiosyncrasy from the assemblage through the incorporation of data from a large number of archaeological sites may offer different results.
Should projectile points identified as dart and arrow tips both be identified, a robust test for inferred bimodality will then be applied employing Hartigan's dip test for unimodality within the R Project for Statistical Computing (R) software framework (R Core Team 2013). The presence of a multi-modal distribution in the Meadowood point metric data set will be interpreted as evidence of the presence of two sub-variants of Meadowood points within the assemblage: a larger variety employed as dart tips and a smaller variety employed as arrow tips. A unimodal distribution will be interpreted as evidence that no distinct subtypes exist in the assemblage. The results of this meta-analysis will be contrasted with those from Snarey and Ellis's (2010) study.

History of Investigations

Until relatively recently it had been common to assume that the bow and arrow had a relatively late introduction appearing in the Northeastern North America, having appeared around AD 700 when it supplanted thrown spears or darts whose power may have been augmented through the use of spear-thrower sticks known as atlatls (e.g. Blitz 1988:131; Shott 1993). By the 21st century a number of studies had begun to question this and suggested that the bow and arrow may have arrived 3,500 years ago or even earlier, during the Late Archaic period. Examples of these studies are Bradbury's (1997) and Odell's (1988) studies of Midwestern Archaic sites. J. V. Wright has argued that the bow and arrow arrived in the Great Lakes area with the Meadowood period of the Early Woodland, *c.*2,800 BP (Wright 1994:622). Even earlier than this, the late Ian Kenyon made the case in an unpublished paper that Crawford Knoll points from Southern Ontario may in fact represent arrow tips in the province *c.*3,500 BP due to their small size and narrow stem widths, an opinion echoed by William Ritchie regarding Lamoka points from New York State (Ritchie 1971:29-30).

Beginning in the late 1970s, attempts were made to use known collections of ethnographically collected arrow and dart tips to establish a concrete model of the morphological differences between these two types of projectile points based on metric attributes. David Hurst Thomas undertook the first such study in 1978, utilizing comparative collections from as far afield as New Guinea and Australia. His study, however, suffered from a poor sample of dart tips (n=10). Bradbury refined Thomas's formula in 1997, but made use of the same comparative sample and thus was still hampered by a small sample of dart tips. In 1997 Michael Shott developed discriminant functions based on the analysis of one, two, three and four metric attributes with the help of a larger comparative collection that included nearly four times the number of dart tips that Thomas and Bradbury had had access to (n=39). Experimental trials have resulted in the conclusion that Shott's three-attribute and one-attribute discriminant functions are the most effective of the four, resulting in correct identification of arrow tips and dart tips 86% and 88% of the time, respectively (Shott 1997, Snarey and Ellis 2010).

With this result in mind, this study will make use of Shott's one-attribute discriminant function to evaluate a selection of Meadowood points. The attribute evaluated by this function is shoulder width, which would from these results appear to have the greatest effect on the penetrative effectiveness of a projectile considering the widely differing forces of impact of arrows versus darts. It is also more often observable in incomplete artifacts than other metric attributes, such as overall length (Erwin *et al.* 2005:51, Morrissey 2009:44, Shott 1997:99). Shott himself noted the effectiveness of the rule of thumb that projectile points narrower than 20 mm at the shoulder are most often arrow tips, despite the technical complexity of his four discriminant functions (Shott 1997:99).

Until the work of Snarey and Ellis (2010) and Snarey (2000), no attempt had been made to apply metric techniques devised elsewhere for the distinction of arrow tip from dart tip projectile points to assemblages from Ontario and the debate over the date of the introduction of the bow and arrow remained largely speculative. The main purpose of their 2010 was to evaluate Ian Kenyon's belief that Crawford Knoll type points are in fact arrow tips, and although points from the Broadpoint Archaic, Smallpoint Archaic and Early Woodland were analyzed it was admitted by the authors that the sample was clearly weighted towards the Late Archaic (Snarey and Ellis 2010:21). Although the metric evidence they presented made a clear case for the use of Crawford Knoll points as arrow tips, doubt was cast on this conclusion by the fact that Thomas and Bradbury's more antiquated functions returned 14.3% and 9.4% rates of identification of Meadowood points as arrow tips and Shott's most reliable method classified only 4.9% of Meadowood points as arrow tips (Snarey and Ellis 2010: 30). As Meadowood post-dates Crawford Knoll by approximately 700 years and cases for cultural continuity between these periods have been made (Ritchie 1971:24), the apparent adoption and subsequent abandonment of bow and arrow technology was seen as anomalous.

Method

Shott's one-attribute discriminant function works by comparing the shoulder width of a projectile point with the range of variation seen in ethnographically collected specimens known to be either arrow or dart tips. The range of variation of these two classes are expressed as the formulae:

Dart: 1.40(shoulder width) - 16.85=X

Arrow: 0.89(shoulder width) - 7.22=X

The values generated by these formulae express the degree to which the observed shoulder width best matches the known ranges of variation with the larger X value representing the type, either arrow or dart, to which it most likely belongs (Shott 1997). Meadowood point shoulder width data was collected from a variety of sites assessed in a cultural resource management context by Archaeologix, Golder, Stantec, and TMHC between 2000 and 2017. These data were then subject to Shott's one-variable discriminant function analysis in order to determine whether a larger and more varied sample would yield significantly different results than Snarey and Ellis's study. The assembled width values of all Meadowood points included in this study were then subject to a test for inferred bimodality. This test assumed that multimodality represents bimodality and employed Hartigan's dip test for unimodality within the R software framework.

The dip test measures multimodality in a sample of the maximum difference, over all sample points in the data set, between the empirical distribution function and the unimodal distribution function that minimizes that maximum difference. Other than unimodality it makes no further assumptions about the form of the distribution indicated by the acceptance or rejection of the null hypothesis. P-values range from 0 to 1. P-values equal to or less than 0.05 indicate significant bimodality and p-values greater than 0.05 but less than 0.10 suggest bimodality with marginal significance, while p-values greater than 0.10 indicate high confidence in unimodality (Hartigan and Hartigan 1985). In this case a low p-value rejecting the null hypothesis of unimodality is assumed to indicate a bimodal distribution, although it should be noted that the test does not indicate how many modes may be present in a multimodal result (R Core Team 2013).

Bimodal test results were further explored with the Density function of the R software framework. This function was used to generate normal density curves estimated from the Meadowood point shoulder width data set. The algorithm used in this function disperses the mass of the empirical distribution function over a regular grid and then uses the fast Fourier transform to convolve this approximation with a series of best-fit normal curves using linear approximation (R Core Team 2013).

Results

Meadowood point shoulder width data was collected from a variety of cultural resource management reports, resulting in a significantly larger sample size (n=113) than Snarey and Ellis's 2010 study had to work with (n=61). Projectile point metric data was drawn from 34 archaeological sites from across Southwestern Ontario (Archaeologix 2002, 2004a, 2004b, 2005a, 2005b, 2006, 2007a, 2007b; Golder Associates 2010, 2011a, 2011b; Government of Ontario 2018; Stantec 2011, 2014; TMHC 2013), as opposed to the previous study that included points collected from only two sites. These data were subject to Shott's one-variable discriminant function analysis, and results are presented in Table 1 below for each point examined.

Table 1: Discriminant Function Analysis Results.

Site	Catalog#	Shoulder Width	Dart Value	Arrow Value	Type
AlHa-10	53	17.1	7.09	8.00	arrow
AlHa-10	163	20.0	11.15	10.58	dart
AlHa-10	215	16.8	6.67	7.73	arrow
AgHf-27	3	18.2	8.63	8.98	arrow
AdHk-48	25	19.7	10.73	9.69	dart
AdHk-48	192	23.1	15.49	13.34	dart
AdHk-48	207	23.6	16.19	13.78	dart
AgHi-26	720	18.1	8.49	8.89	arrow
AgHi-26	721	18.3	8.77	9.07	arrow
AgHi-27	262	18.2	8.63	8.98	dart
AgHi-27	276	19.1	9.89	9.78	dart
AgHi-27	296	19.4	10.31	10.05	dart
AgHi-27	332	20.3	11.57	10.85	dart
AgHi-27	339	17.6	7.79	8.44	arrow
AgHi-27	348	22.9	15.21	13.18	dart
AgHi-27	357	18.8	9.47	9.51	arrow
AgHi-27	359	19.2	10.03	9.87	dart
AgHi-27	361	18.5	9.05	9.25	arrow
AgHi-27	383	26.2	19.83	16.10	dart
AgHc-55	1	28.7	23.33	18.32	dart
AfHh-306	1	23.2	15.63	13.43	dart
AfHh-306	44	24.1	16.89	14.23	dart
AfHh-306	54	22.6	14.79	12.89	dart
AfHh-306	78	18.3	8.77	9.07	arrow

Site	**Catalog#**	**Shoulder Width**	**Dart Value**	**Arrow Value**	**Type**
AfHh-307	1	21.8	13.67	12.18	dart
AfHh-307	24	25.8	19.27	15.74	dart
AfHh-307	154	19.4	10.31	10.05	dart
AfHh-307	159	24.0	16.75	14.14	dart
AfGw-150	78	25.1	18.29	15.12	dart
AfGw-150	221	20.3	11.57	10.85	dart
AfGw-150	368	17.4	7.51	8.27	arrow
AdHc-10	75	18.1	8.49	8.89	arrow
AgGs-3	1686	27.2	21.23	16.99	dart
AgGs-3	1613	17.3	7.37	8.18	arrow
AgGs-3	1184	23.8	16.47	13.96	dart
AgGs-3	1576	18.1	8.49	8.90	arrow
AgGs-3	1310	22.2	14.23	12.54	dart
AfGt-62	2304	21.5	13.25	11.92	dart
AfGt-62	2263	23.1	15.49	13.34	dart
AfGt-62	3161	25.0	19.55	15.03	dart
AfGt-62	2272	20.6	11.99	11.11	dart
AfGt-62	4288	22.3	14.37	12.63	dart
AfGt-62	2853	23.8	16.47	13.96	dart
AfGt-62	4457	16.4	6.11	7.38	arrow
AfGt-62	2064	22.2	14.23	12.54	dart
AfGt-62	2393	26.1	19.69	16.01	dart
AfGt-62	4398	21.1	12.69	11.56	dart
AfGt-62	3067	26.3	19.97	16.19	dart
AfGt-62	3094	20.7	12.13	11.20	dart
AfGt-62	2585	28.8	23.47	18.41	dart
AfGt-168	1159	23.1	15.49	13.34	dart
AfGt-168	1419	19.9	11.01	10.49	dart
AfGt-168	1387	22.0	13.95	12.36	dart
AfGw-196	1	22.0	13.95	12.36	dart
AfGw-205	1	24.1	16.89	14.23	dart
AfGw-205	17	24.6	17.59	14.67	dart
AfGw-205	39	22.2	14.23	12.54	dart
AfGw-205	102	23.1	15.49	13.34	dart
AfGw-205	109	21.9	13.81	12.27	dart
AfGw-205	125	20.4	11.71	10.94	dart
AfGw-224	1	25.2	18.85	15.21	dart
AfGx-465	1	21.0	12.55	11.47	dart
AfGx-465	12	22.8	15.07	13.07	dart
AfGx-465	36	17.8	8.07	8.62	arrow

Site	Catalog#	Shoulder Width	Dart Value	Arrow Value	Type
AfGx-465	51	22.8	15.07	13.07	dart
AfGx-465	60	21.4	13.11	11.83	dart
AfGx-482	1	21.0	12.55	11.47	dart
AfHa-441	1	28.2	22.63	17.88	dart
AfHa-441	4	26.5	20.25	16.37	dart
AfHa-441	32	24.6	17.59	14.67	dart
AfHa-441	84	21.2	12.83	11.65	dart
AfHa-441	89	23.8	16.47	13.96	dart
AfHa-441	177	25.0	19.55	15.03	dart
AfGx-510	1	29.3	24.17	18.86	dart
AfGx-583	1	23.9	16.61	14.05	dart
AfGx-583	17	24.6	17.59	14.67	dart
AfGx-583	55	23.1	15.49	13.34	dart
AfGx-583	76	25.2	18.85	15.21	dart
AfGx-583	91	24.7	17.73	14.76	dart
AfHa-557	1	32.1	28.09	21.35	dart
AfHa-521	1	22.0	13.95	12.36	dart
AfHa-521	14	21.1	12.69	11.56	dart
AfHa-521	35	19.3	10.17	9.96	dart
AfGx-698	1	23.2	15.63	13.43	dart
AfGx-698	12	24.0	16.75	14.14	dart
AfGx-698	41	22.5	14.65	12.81	dart
AfGx-698	74	21.9	13.81	12.27	dart
AfGx-698	79	25.8	19.27	15.74	dart
AfGx-698	82	27.1	21.09	16.90	dart
AfGx-698	91	22.0	13.95	12.36	dart
AfGx-698	104	20.6	11.99	11.11	dart
AfGx-698	144	25.1	13.25	11.92	dart
AfGx-698	173	24.4	17.31	14.50	dart
AfGx-888	1	23.0	15.35	13.25	dart
AfHa-836	2	23.4	15.91	13.61	dart
AfHa-836	32	22.6	14.79	12.89	dart
AfHa-836	43	21.8	13.67	12.18	dart
AfHa-836	44	25.7	19.13	15.65	dart
AfHa-836	69	24.7	17.73	14.76	dart
AfHa-836	82	23.8	16.47	13.96	dart
AfGw-176	2	25.1	13.25	11.92	dart
AfGw-176	12	24.6	17.59	14.67	dart
AfGx-720	2	25.0	19.55	15.03	dart
AfGx-720	3	24.0	16.75	14.14	dart

Site	Catalog#	Shoulder Width	Dart Value	Arrow Value	Type
AfGw-137	1	20.0	11.15	10.58	dart
AfGw-144	1	24.0	16.75	14.14	dart
AfGw-158	3	26.0	19.55	15.92	dart
AfGx-721	24	27.0	20.95	16.81	dart
AfGx-711	27	24.0	16.75	14.14	dart
AfGx-711	31	27.0	20.95	16.81	dart
AfGv-127	1	22.0	13.95	12.36	dart
AfHa-956	125	23.5	16.05	13.70	dart
AfHa-836	99	22.5	14.65	12.81	dart
Totals: Arrow (n=15) Dart (n=98)					

Of the 113 Meadowood points analyzed, 86.7% (n=98) were classified as dart tips by Shott's one-variable discriminant function and 13.3% (n=15) were classified as arrow tips. While dart tips still make up the clear majority of the sample, it is interesting to note that in Snarey and Ellis's (2010) study none of the 35 Meadowood points collected from the Welke-Tonokonoh Site analyzed with this method were classified as arrow tips. Snarey and Ellis' results from the Bruce Boyd Site were comparable to the current study's results, with 11.5% of the 26 Meadowood points classified as arrow tips by Shott's one-variable discriminant function (Snarey and Ellis 2010:30). Taken overall, the data set presented in this study identifies Meadowood points as arrow tips in 13.3% of cases as opposed to Snarey and Ellis's overall result of 4.9%.

Given these results, it would appear that the shoulder widths of Meadowood points observed on the Welke-Tonokonoh Site may be anomalously large and apt to skew results of this type of study. The unusually wide shoulder measurements from this site were in fact noted by the authors. They attributed this to the lack of lateral retouch seen on Meadowood points from the Welke-Tonokonoh Site, resulting in wider than average shoulders (Snarey and Ellis 2010:30). If Welke-Tonokonoh is excluded from the data set, we see an overall rate of identification of Meadowood points as arrow tips 10.2% of the time in the 2010 study. Although this percentage is still low, it raises the possibility that approximately one in ten of the more typical Meadowood points in Snarey and Ellis's assemblage may have functioned as arrow tips.

The presence in the assemblage of Meadowood points classified as both dart and arrow tips indicated the possible presence of arrow and dart tip subtypes, or the generalized use of these points as either dart or arrow tips as circumstances demanded. With the possibility of two subtypes confirmed, a Hartigan's dip test for unimodality was applied to the Meadowood point shoulder width data set. The results of this test indicated bimodality, as shown in Figure 2 and as evident in the test result below:

Hartigan's dip test results for Meadowood point shoulder width data:

D=0.02788; p-value=0.08149

Null hypothesis (unimodal distribution) rejected; results suggest bimodality with marginal significance.

To further explore these tests results, the Density function of the R software framework was used to generate estimated normal density curves from the Meadowood point shoulder width data set (Figure

3). The Density function resulted in the Meadowood point shoulder width values being divided into two normal curves, one of which is entirely composed of values equal to or less than 20 mm.

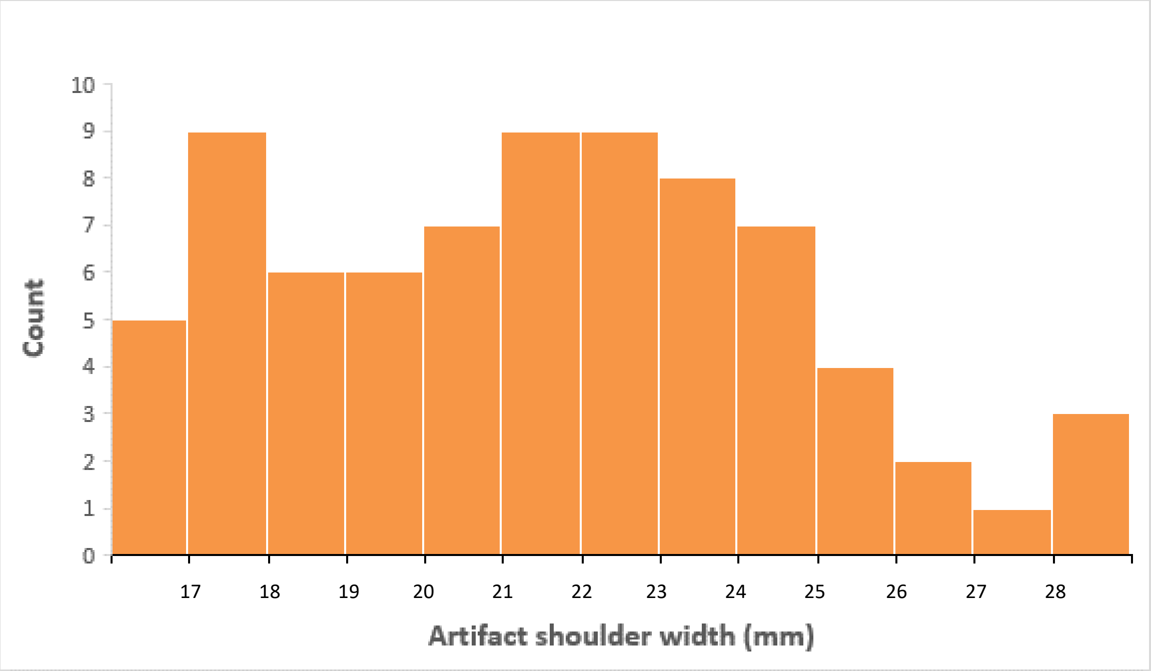

Figure 2: Meadowood Point Shoulder Width Values Count Histogram.

Conclusion

With the increasing body of evidence for use of the bow and arrow in the Northeast prior to the middle Woodland, a more complex picture of the adoption of this technology is emerging. It has been noted that the bow and arrow has several drawbacks that call its technological superiority for hunter-gatherers to the thrown dart into serious question. In particular, the amount of technical knowledge, skill and effort required to build and maintain effective bows and arrows, the lower lethality of these lighter weapons when used to hunt large game and the greater difficulty of procuring appropriate construction materials make it a far more likely scenario that small groups of people practicing broad-based subsistence strategies would use the bow to compliment the dart when appropriate rather than abandon the dart outright. To this end, changes in projectile tip morphology could be seen as reflective of a weighted preference toward one weapon system or the other rather than as proof positive of the presence of either one or the other. The presence of even low numbers of Meadowood points that would function effectively as arrow tips supports the idea that although bow and arrow use may have waned from the Late Archaic to Early Woodland, it need not have necessarily died out entirely and a cultural continuity could have been maintained from Crawford Knoll to Meadowood times.

The presence of both arrow and dart tips in the Early Woodland period indicates the possibility of both weapon systems being in use during this period. The bimodal distribution of metric values within the projectile point shoulder width data set suggests that distinct arrow and dart tip subtypes of the Meadowood point did exist. The relatively small percentage of arrow tips, relatively small sample size, large range of variability in shoulder width values, and closeness of the median value of the two modes observed in the data set may account for the determination that bimodality is present with only marginal significance. The Hartigan's dip test is less sensitive when these circumstances are present (R Core Team 2013).

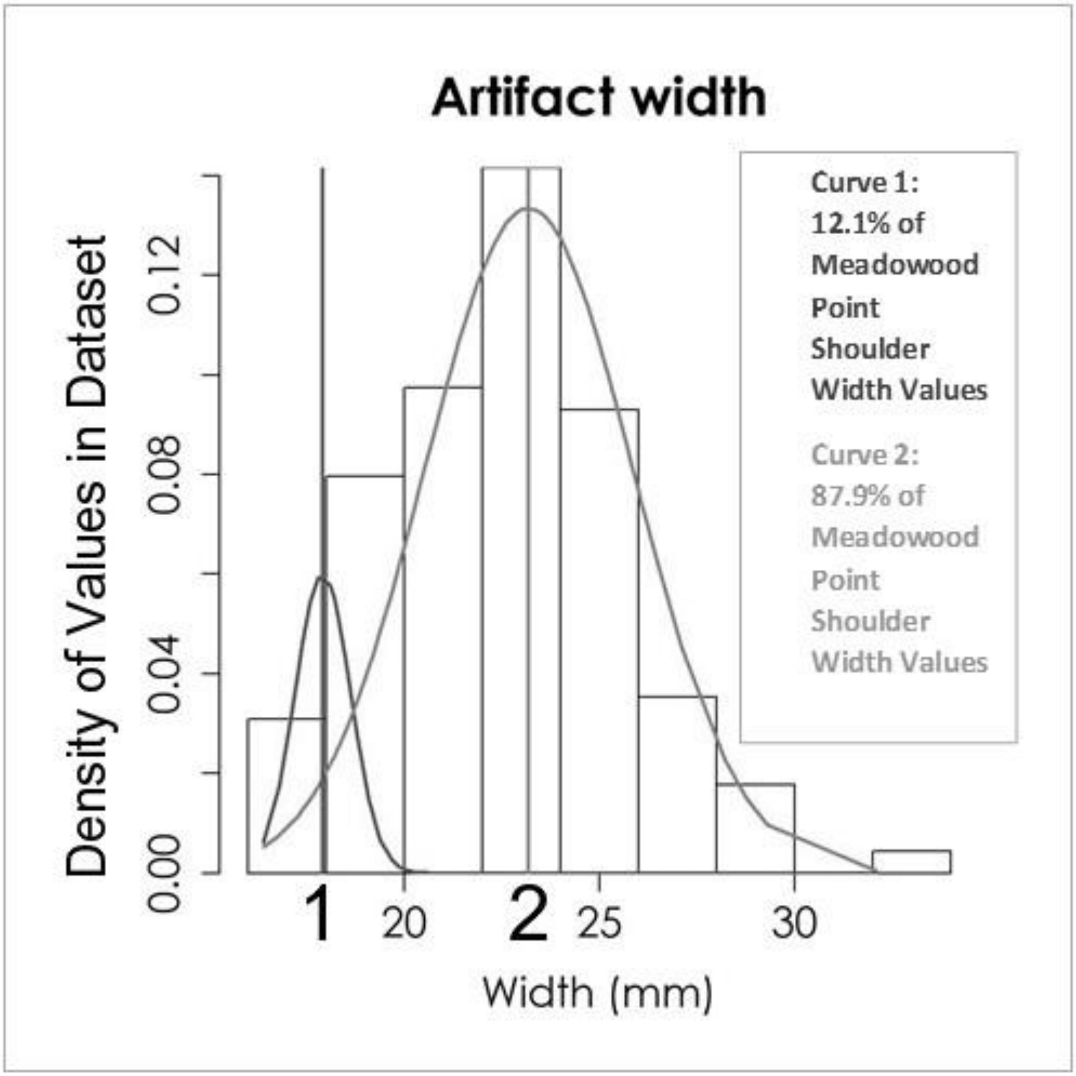

Figure 3: Meadowood Point Shoulder Width Density Histogram.

The interpretation of the results of the test for bimodality in the Meadowood point shoulder data is supported by the identification of two estimated density curves within the data set (Curve 1=12.1% of shoulder width values, Curve 2=87.9% of shoulder width values), which approximate the results of the one-attribute discriminant function analysis (arrow tips=13.3%, dart tip=86.7%). The relationship between these two results is strengthened by the observation that Curve 1, which makes up a percentage of the assemblage similar to that of arrow tips identified by discriminant function analysis, is entirely composed of shoulder width values of 20 mm or less. Shott noted that projectile points narrower than 20 mm at the shoulder are most often arrow tips in his 1997 study.

This study's analytical results indicate that two subtypes of Meadowood points could have existed, consisting of a larger dart tip subtype and a smaller arrow tip subtype. The dart tip subtype is by far the more numerous in this study's assemblage, suggesting a weighted preference toward this weapon system in the Meadowood period of the Early Woodland in Southwestern Ontario.

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Speakers for Member's Night, Papers for Kewa and Chapter Executive

Chapter members are reminded that our February 14, 2019 meeting is the traditional **Member's Night** where we feature several speakers giving short, 10-15 minute presentations. Right now **we have only one committed speaker** so if you would be willing to give a talk at the 14th meeting on some aspect of your recent archaeology related endeavours please contact Chris Ellis (cjellis@uwo.ca) asap.

With this issue's release we are now some two years behind in *Kewa* issues!!! We appreciate the efforts of individuals like Adam Hossack in this issue to help resolve this problem but obviously much more help is needed. The editors are willing to spend some time editing for content, format and style CRM reports, etc. So please think about submissions and asap.

It is also now time to consider a new Chapter executive for the coming year and some individuals, like current President Chris Ellis, would like to step down so he can work on editing *Kewa* issues and even writing new archaeology papers. So anyone who would like to be on the executive should contact him or other current executive members listed on the cover page of this issue!